ABSTRACT

A semiconductor device comprises a single crystal substrate, a nucleus formation buffer layer formed on the single crystal substrate, and a lamination layer including a plurality of $Al_{1-x-y}Ga_xIn_yN$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $x+y \leqq 1$) layers laminated above the nucleus formation buffer layer. The nucleus formation buffer layer is formed of $Al_{1-s-t}Ga_sIn_tN$ ($0 \leqq s \leqq 1$, $0 \leqq t \leqq 1$, $s+t \leqq 1$) and is formed on a surface of the substrate such that the nucleus formation buffer layer has a number of pinholes for control of polarity and formation of nuclei. A method of fabricating a semiconductor device comprises the steps of: forming, above an $Al_{1-x-y}Ga_xIn_yN$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $x+y \leqq 1$) semiconductor layer doped with a p-type dopant, a cap layer for preventing evaporation of a constituent element of the semiconductor layer, the cap layer being formed of one of AlN in which a p-type dopant is added and Al_2O_3, subjecting the semiconductor layer to heat treatment, and removing at least a part of the cap layer.